

SAN FRANCISCO PUBLIC LIBRARY

3 1223 10225 9943

bart impact program

IMPACTS OF BART ON BAY AREA HEALTH CARE INSTITUTIONS



D
REF
300.42
B2613hc

technical memorandum

The BART Impact Program is a comprehensive, policy-oriented study and evaluation of the impacts of the San Francisco Bay Area's new rapid transit system (BART).

The program is being conducted by the Metropolitan Transportation Commission, a nine-county regional agency established by state law in 1970.

The program is financed by the U.S. Department of Transportation, the U.S. Department of Housing and Urban Development, and the California Department of Transportation. Management of the Federally-funded portion of the program is vested in the U.S. Department of Transportation.

The BART Impact Program covers the entire range of potential rapid transit impacts, including impacts on traffic flow, travel behavior, land use and urban development, the environment, the regional economy, social institutions and life styles, and public policy. The incidence of these impacts on population groups, local areas, and economic sectors will be measured and analyzed. The benefits of BART, and their distribution, will be weighed against the negative impacts and costs of the system in an objective evaluation of the contribution that the rapid transit investment makes toward meeting the needs and objectives of this metropolitan area and all of its people.

BART IMPACT PROGRAM

IMPACTS OF BART
ON BAY AREA HEALTH CARE
INSTITUTIONS



MARCH 1977

TECHNICAL MEMORANDUM

DOCUMENT IS AVAILABLE TO THE PUBLIC THROUGH THE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VIRGINIA 22151

PREPARED FOR
U.S. DEPARTMENT OF TRANSPORTATION

AND
U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

3 1223 10225 9943

NOTICE

This document is disseminated under the sponsorship of the U.S. Department of Transportation and the U.S. Department of Housing and Urban Development in the interest of information exchange. The United States Government and the Metropolitan Transportation Commission assume no liability for its contents or use thereof.

PREPARED BY
JEFFERSON ASSOCIATES, INC.

UNDER CONTRACT WITH THE
METROPOLITAN TRANSPORTATION COMMISSION

FOR THE
U.S. DEPARTMENT OF TRANSPORTATION

AND THE
U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

UNDER
CONTRACT DOT-OS-30176
TASK ORDER 6

MARCH 1977



Digitized by the Internet Archive
in 2015

<https://archive.org/details/impactsofbartonb1977mink>

BIBLIOGRAPHIC DATA SHEET	1. Report No. DOT-BIP-TM-22-6-77	2.	3. Recipient's Accession No.
4. Title and Subtitle Impacts of the Bay Area Rapid Transit System on Health Care Institutions			5. Report Date March, 1977
6. DOT/MTC			
7. Author(s) David Minkus, Pat M. Gelb, Jefferson Associates, Inc.			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Metropolitan Transportation Commission, Hotel Claremont Berkeley, California; under contract with Jefferson Associates, Inc., 155 Montgomery St., Suite 808, San Francisco, California			10. Project/Task/Work Unit No. 6
11. Contract/Grant No. DOT-OS-30176			
12. Sponsoring Organization Name and Address United States Department of Transportation U.S. Department of Housing and Urban Development Washington, D.C.			13. Type of Report & Period Covered Technical Memorandum
14. DOT			
15. Supplementary Notes			
16. Abstracts This report describes the effects of BART upon local health care institutions, as determined by surveys of patient travel to medical care facilities having varying degrees of public transit and BART service. Administrative personnel were also interviewed to discover and report upon institutional policy-making responses to the presence of BART.			
17. Key Words and Document Analysis. 17a. Descriptors Bay Area Rapid Transit System (BART) BART Impact Program Health Care Institutions Social Impacts - Survey Analysis Key Informant Interviews			
17b. Identifiers/Open-Ended Terms Health Care Clients Health Care Administrators			
17c. COSATI Field Group			
18. Availability Statement This document is available through the National Technical Information Service, Springfield, VA 22161	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages	
	20. Security Class (This Page) UNCLASSIFIED	22. Price	





The 71-mile system includes 20 miles of subway, 24 miles on elevated structures and 27 miles at ground level. The subway sections are in San Francisco, Berkeley, downtown Oakland, the Berkeley Hills Tunnel and the Transbay Tube.

Stations: The 34 stations include 13 elevated, 14 subway and 7 at ground level. They are spaced at an average distance of 2.1 miles: stations in the downtowns are less than $\frac{1}{2}$ -mile apart while those in suburban areas are 2 to 4 miles apart. Parking lots at 23 stations have a total of 19,000 spaces. There is a fee (25¢) at only one of the parking lots. BART and local agencies provide bus service to all stations.

Trains: Trains are from 4 to 10 cars long. Each car is 70 feet long and has 72 seats. Top speed is 80 mph with an average speed of 38 mph including station stops. All trains stop at all stations on the route.

Automation: Trains are automatically controlled by the central computer at BART headquarters. A train operator on-board each train can over-ride automatic controls in an emergency.

Magnetically encoded tickets with values up to \$20 are issued by vending machines. Automated fare gates at each station compute the appropriate fare and deduct it from the ticket value. At least one agent is present at each station to assist patrons.

Fares: Fares range from 25¢ to \$1.45, depending upon trip length. Discount fares are available for the physically handicapped, children 12 and under and persons 65 and over.

Service: BART serves the counties of Alameda, Contra Costa and San Francisco, which have a combined population of 2.4 million. The system was opened in five stages, from September, 1972, to September, 1974. The last section to open was the Transbay Tube linking Oakland and the East Bay with San Francisco and the West Bay.

Routes are identified by the terminal stations: Daly City in the West Bay, Richmond, Concord and Fremont in the East Bay. Trains operate every 12 minutes during the daytime on three routes: Concord - Daly City, Fremont - Daly City, Richmond - Fremont. This results in 6-minute train frequencies in San Francisco, downtown Oakland and the Fremont line where routes converge. In the evening, trains are dispatched every 20 minutes on only the Richmond - Fremont and Concord - Daly City routes. Service is provided weekdays only, between 6 A.M. and midnight. Future service will include a Richmond - Daly City route and weekend service. Trains will operate every 6 minutes on all routes during the peak periods of travel.

Patronage: Approximately 130,000 one-way trips are made each day. 200,000 trips are anticipated under full service conditions.

Cost: BART construction and equipment cost \$1.6 billion, financed primarily from local funds: \$942 million from bonds being repaid by the property and sales taxes in the three counties, \$176 million from toll revenues of transbay bridges, \$315 million from federal grants, and \$186 million from interest earnings and other sources.

TABLE OF CONTENTS

	Page
PREFACE	iv
SUMMARY	v
I. INTRODUCTION	1
A. Scope and Objectives of the Research	1
B. Conceptual Issues and Research Hypotheses	1
II. RESEARCH APPROACH	4
A. Criteria for Selection of Case Study Health Care Institutions	4
B. Selected Case Study Institutions	4
C. Survey Methods	11
D. Key Informant Interviews	15
III. FINDINGS	18
A. Overview of Survey Findings for All Cases	18
B. Findings for Individual Cases	22
IV. CONCLUSIONS AND POLICY IMPLICATIONS	39
A. Conclusions	39
B. Policy Implications	40

LIST OF TABLES

1. SCHEMATIC OF HEALTH CARE INSTITUTIONS SURVEY WORK	13
2. RESPONDENTS' TRANSPORTATION MODE TO MEDICAL FACILITY ON DAY(S) OF SURVEY	19
3. WITHOUT PUBLIC TRANSPORTATION WOULD RESPONDENT BE DEPENDENT UPON OTHERS FOR TRANSPORTATION TO MEDICAL CARE?	20
4. DO TRANSPORTATION PROBLEMS AFFECT RESPONDENTS' DECISION TO SEEK MEDICAL CARE?	21

	Page
5. TRANSPORTATION MODES AVAILABLE FOR USE TO MEDICAL FACILITY	23
6. TRANSPORTATION MODES ORDINARILY USED FOR NON-MEDICAL TRIPS	24
7. TRANSPORTATION MODE DAY OF SURVEY: HERRICK HOSPITAL 1974 AND 1976 COMPARED	27
8. RESPONDENTS' MAJOR CONCERNS WHEN CHOOSING A MEDICAL FACILITY	35
9. RESPONDENT AGE GROUPS	36

LIST OF FIGURES

1. KAISER-PERMANENTE MEDICAL CENTER, WALNUT CREEK, SERVICE AREA AS DETERMINED BY SURVEY	6
2. HERRICK MEMORIAL HOSPITAL, BERKELEY, SERVICE AREA AS DETERMINED BY SURVEY	7
3. UNIVERSITY OF CALIFORNIA, SAN FRANCISCO, MEDICAL CENTER, SERVICE AREA AS DETERMINED BY SURVEY	9
4. ALTA BATES HOSPITAL, BERKELEY, SERVICE AREA AS DETERMINED BY SURVEY	10
5. KAISER-PERMANENTE HOSPITAL, OAKLAND, SERVICE AREA AS DETERMINED BY SURVEY	12
6. PERCEIVED AVAILABILITY AND ACTUAL USE OF VARIOUS MODES	37

EXHIBIT

1. FORMAT AND WORDING OF ALL TRAVEL SURVEY QUESTIONS	16
--	----

PREFACE

The Institutions and Life Styles Project (ILS) of the BART Impact Program investigates the effects which BART use and BART accessibility have on the activities, schedules and integrated life routines of Bay Area population groups, as well as upon the functioning and serviceability of selected institutions which address the needs of Bay Area residents. The Study of BART Impacts on Health Care Institutions is one separate component of the ILS Project. The investigation of BART Impacts on Health Care Institutions focuses primarily upon how patients and visitors travel to medical care facilities and whether the availability of BART improves people's ability to obtain medical care.

A variety of factors related to patients' and others' travel to medical services were surveyed at five major medical facilities throughout the Bay Area. The findings of these surveys are disclosed in the following report, and compared insofar as possible, with the results of similar previous surveys conducted by the medical facilities themselves. In addition, we interviewed hospital administrators and others who were likely to be knowledgeable about the characteristics and accessibility concerns of their local clienteles.

The success of Jefferson Associates' personal surveys of patients and others at the different hospitals represented in this report depended largely on the ready assistance we received from administrators and staff. Special thanks are due to Mr. Gary Passama, Assistant Administrator, and Mrs. Betty Yourd, Director of Volunteers, Herrick Memorial Hospital; Mr. Joseph Mulroy, Hospital Administrator, Mr. Gary Somers, Public Relations Officer, and Mrs. Muriel Thompson, Multi-phasic Department, Kaiser-Permanente Hospital, Oakland; Mr. Henry P. Fenhagen, Assistant Administrator, and Ms. Donna Pacheco, Reception Supervisor, Kaiser-Permanente Medical Center, Walnut Creek; Mr. Howard Haggerty, Vice President, Property Management, Kaiser Hospitals; Mr. Richard Adam, Associate Administrator, and Mr. Dick Abbott, Assistant Administrator for Hospital Systems, Alta Bates Hospital; Mr. George W. Crapo of the Bateman Neighborhood Association, Inc.; and Mr. James A. Wood, Transportation Coordinator, Mr. Howard J. Peterson, Administrative Resident, Ambulatory Care Center, Ms. Joyce McGriff, Administration, Ms. Pat Dirdoni, Community Services, Mr. Terry O'Connor and Mr. Jim Wiczai, Director of Clinics, University of California Medical Center, San Francisco. Responsibility for the content of this report, however, rests entirely with Jefferson Associates.

SUMMARY

Introduction

The study of BART Impacts on Health Care Institutions focuses primarily upon the transportation needs of patients and others travelling to medical care facilities in the Bay Area. We sought to determine what were the transportation options and difficulties individuals perceived when they needed to seek health care or to visit someone in a hospital. We focused specifically upon how travel needs related to people's accessibility to a variety of medical care institutions, indirectly influencing the readiness with which people would seek medical attention, or the quality of obtainable care. Were individuals dependent upon family and friends when they needed to get to health care? Had clientele characteristics or transportation-related patterns around medical facilities changed perceptibly since BART had been in operation? Finally, what were the institutions' own orientations to and expectations from BART?

Research Approach

We interviewed patients and others at five medical care facilities within the Bay Area. The selected medical centers and hospitals offered a variety of services to differing clienteles, over a wide geographic area, with varying proximity to BART. The surveys were conducted at the medical centers during ordinary clinic and visiting hours. Interviewers were assisted by hospital staff, and the brief, self-administered survey forms were distributed according to regular procedures among ordinary hospital registration materials. The content of the survey instrument and the selection of medical departments to participate in the survey was determined in conference with high-level staff. We also interviewed administrators and other staff members concerning the impacts of the use of BART and other public transportation which they had anticipated or observed upon clientele and travel patterns around the medical facility.

Summary of Findings

The case studies produced a range of findings on the research issues in focus. Private facilities with predominantly middle-and upper-middle-income white clienteles, like Kaiser-Permanente Medical Center, Walnut Creek and Alta Bates Hospital, Berkeley, revealed low levels of transportation dependence as measured by the survey, high levels of private automobile use and extremely low levels of public transit use including BART. Public facilities whose clienteles included lower and lower-middle income and ethnic minority individuals showed greater levels of expressed

transportation dependency, lower levels of private automobile use and higher levels of public transit use including BART. Local factors militating against private automobile use and the income level of clientele groups (with lower income implying lower auto access) appeared to be of key importance, so that the highest public transit use was reported where both of these factors were present.

Interviews with health care administrators and staff also provided some data on the institutions' accessibility via BART and other public transit as well as their expectations of BART-related impacts. Administrative expectations from and orientations toward BART were consistent with the survey findings. Where local factors were conducive to private automobile use, clientele usership did not appear to justify the institutions' investment in feeder systems from BART. However, where local conditions militated against private automobile use, administrators looked to BART and other public transit as a means of alleviating neighborhood problems. For example, at University of California Medical Center where parking is scarce, administrators sought to encourage public transit use by their staff. Also, proximity to BART had influenced selection of the location of a new medical facility.

Kaiser-Permanente Medical Center, Walnut Creek

Kaiser-Permanente, Walnut Creek is a private membership facility with a predominately White, middle- and upper-middle-income clientele. The facility enjoys feeder service from BART--the bus stops across the street--and many respondents travelled from communities served by BART, but adequate parking and the mixed commercial area are factors conducive to private auto use. Surveys completed by 159 outpatients revealed almost no public transportation use (one bus rider, one BART rider). Transportation dependence as measured by the survey was also low. Thus, even though BART may have increased people's potential transportation options, it has had little impact on their mobility to Kaiser Walnut Creek.

Herrick Memorial Hospital, Berkeley

Several characteristics of the Herrick Memorial Hospital case suggested that its clients might use public transportation or BART to reach the hospital. First the hospital is situated seven and one-half blocks from Berkeley's downtown BART station, while the nearest A.C. Transit bus stop is less than a block away. Second, recent hospital expansion planning highlighted problems of local neighborhood traffic congestion. Moreover, Herrick's clientele is predominately low-income, and racially mixed. Indeed, the Herrick findings showed the largest percentage of non-driving outpatients of all of the hospitals surveyed (32.7%). Transportation dependence as measured by the survey was also high. These findings support a tentative conclusion that public transportation (and BART) influences the mobility and accessibility of transportation-disadvantaged persons to medical care.

University of California Medical Center, San Francisco

The University of California Medical Center was selected as a case study because it also seemed to offer characteristics conducive to public transportation use, although it is comparatively inconvenient to BART. The medical center demonstrated the widest patient out-reach of any of the medical facilities proposed for study. Parking in the immediate area of the facility is extremely scarce and the object of local contention. The clientele comprises a wide ethnic and economic spectrum, potentially including many persons who would not have access to their own car. Finally, the institution's own self-surveys revealed the greatest clientele use of public transportation (some 30%); however, these previous surveys did not specify BART as a response option. Our survey corroborated the greatest proportional use of public transportation among respondents (21.9%), although only one patient had travelled to the medical center by BART. Transportation dependency as measured by the survey was also very high.

In sum, although public transportation clearly influences people's mobility to University of California Medical Center, BART has little impact. However, since conditions demonstrated the importance of public transportation in this case, some additional analysis of the data findings and speculation about the conditions under which BART might play a role in people's travel to the medical center were undertaken and are presented in the body of the report text.

Alta Bates Hospital, Berkeley

Alta Bates' private clientele is predominately white, upper-middle and middle-income. Neighbors protest the traffic congestion generated by the hospital, but parking facilities are more than adequate. The hospital is also accessible by BART with connecting A.C. Transit buses from the Ashby, Rockridge, or MacArthur street BART stations, and many respondents originated from points served by BART. However, the overwhelming majority of patients (92.0%) had travelled to the hospital by car. No one had used BART and only one patient travelled by bus. These findings indicate that BART does not impact upon patients' accessibility or mobility to the hospital.

Kaiser-Permanente Hospital, Oakland

The survey findings at Kaiser-Permanente Hospital in Oakland showed moderate levels of public transportation use (9.6%, but no BART riders), as well as of transportation dependency as measured by the survey. These findings seemed consistent with case characteristics: Kaiser Oakland is a membership facility with a mixed clientele of low to middle-income white and ethnic minority persons. A.C. Transit serves the hospital from the MacArthur Street BART station, but there is also ample parking at the facility. Thus, although the Oakland facility exhibits some of the characteristics coincident with transit use at the other facilities, public transit appears to have only minor impacts on

patients' mobility and accessibility to the hospital, while BART apparently has no impact.

Key Informant Interviews

Administrators at facilities serving predominantly white, high-income clienteles where local factors were conducive to private automobile use as at Kaiser Walnut Creek doubted that client usership would justify the expense involved in providing feeder systems from BART. Where local factors urged clients to use public transportation, as at Alta Bates and University of California, San Francisco, Medical Center, feeder systems and BART were cited as possible solutions to neighborhood traffic and parking problems. However, even where administrators assumed low auto access among their clienteles as at Herrick and Kaiser Oakland, the costs of providing feeder access from BART stations posed a primary obstacle. In general, administrative decision-makers predicted the continuing pre-eminence of the automobile as the primary mode of choice to health care, and concentrated their client-oriented transportation planning efforts on the provision of adequate parking. However, a Kaiser executive reported that proximity to BART had influenced the selection of location for the new Richmond facility, and that BART access represented a trade-off in parking spaces which permitted development of a smaller site.

I. INTRODUCTION

A. Scope & Objectives of the Research

As a separate component of the Institutions & Life Styles Project, the study of BART Impacts on Health Care Institutions focuses upon BART's effects on people's ability to schedule and obtain health care services and to choose a medical facility. By improving access to an array of different institutions, BART could also indirectly affect the quality of medical services obtained by Bay Area residents, especially those for whom transportation was a problem.

The study focused upon clientele at selected Bay Area health care institutions. Five case study facilities were selected to include a variety of medical services, differing socio-economic levels of clientele, varying proximity to BART stations or feeder carriers, and a wide geographic area of service. Data on patients' transportation needs and expressed options were collected by survey, and the findings of these surveys are reported and compared whenever possible with similar previous surveys conducted by the institutions.

In addition to the focus upon clientele, we also investigated institutional responses to the availability of BART. We conducted key informant interviews with administrative staff to learn whether the medical facilities themselves had taken steps to improve their linkages to BART and generally, to what extent their capital expenditures decision-making was influenced by BART. The participation of administrative staff also extended beyond the key informant interviews to include the content of survey instruments, the selection of medical departments for survey, and the survey administration procedures.

B. Conceptual Issues and Research Hypotheses

The investigation of BART impacts on health care institutions is organized around five major issue areas. Research questions were formulated within each area to focus the inquiry.

1. Transportation Options and the Choice of a Medical Care Facility

Mobility is closely related to the quality of goods and services available to an individual. Restricted mobility due to personal disadvantage or the lack of public transportation results in a narrowing of the alternative services from which the individual can choose. In cases of severely limited mobility, the individual will not be able to

put the quality or other characteristics of services before accessibility; he will have to choose a facility he can get to.

The survey queried the various factors which participated in respondents' decisions to come to the medical facility they selected. Responses would enable us to focus upon the relative importance of available transportation and the related question of the location of the medical facility or clinic, among the array of factors respondents had to consider in deciding which medical facility to choose. The preliminary findings of early surveys and key informant interviews had indicated that concern with transportation was less important than originally supposed, and it was posited that increasing their alternative transportation options (including BART) would have only a limited impact on patients' decisions to choose one health care institution over another.

2. The Choice of a Transportation Mode for Travel to Health Care Institutions

We focused on respondents' choice of a transportation mode to health care institutions from several points of view. We sought to determine the extent of use of BART and other public transportation, in terms of the facilities' location and service outreach, their proximity to BART stations and feeder connections, and the socio-economic status of their clientele groups. We also looked to compare the survey findings on modal choice with key informant perceptions of the levels of public transit use among their clientele groups, descriptions of formal institutional orientations toward BART, and conceptions of the potential impact of BART upon accessibility to their institution and its overall ability to serve their clientele.

3. Transportation - Disadvantaged Groups

A primary research area related to the two preceding issues of enhanced choice of and mobility to alternative medical care services, focuses on transportation-disadvantaged groups. Transportation-disadvantaged persons include the elderly, the physically disabled, the young, the poor, and others who do not enjoy ready access to a private automobile. These individuals are dependent upon public transportation, family or friends when they need to get somewhere. Since members of this group might require medical services more frequently than the population at large, and since this group should respond more readily to a new transportation option than would those with access to their own auto, we theorized that BART would impact upon the mobility of transportation-disadvantaged persons to health care institutions to a greater extent than it would affect that of the majority population at large.

The survey instruments collected data on several indicators of transportation disadvantage: age, dependency, and available transportation modes were queried in closed-ended format, while open-ended questions requested respondents to describe their transportation difficulties in reaching the medical facility, whether they would be dependent upon family and friends if there were no public transportation, and whether transportation concerns influenced their decision to seek medical care. Individual income and physical data was not collected on this survey.

4. Transportation Options and People's Readiness to seek Medical Attention

Since, as we have seen, mobility can serve to limit or enhance an individual's ability to avail him or herself of goods and services, we also sought to focus upon whether transportation problems affected people's ability to seek medical attention when they needed it. This issue is closely related to that of transportation disadvantage. Where transportation is readily available, the individual need not postpone or do without a necessary appointment. We sought to learn whether BART use would tend to facilitate patients' readiness to seek medical attention when they needed it.

5. The Impact of BART on Capital Expenditures by Health Care Institutions

Since clients' accessibility to its services is a primary aspect of a health care institution's overall ability to serve, many medical institutions are concerned with their transportation access and parking facilities. Added incentive to involve themselves in transportation questions also derives from local community concern over the traffic congestion, noise, and competition for parking generated by a medical center in the neighborhood. By providing non-disruptive access to its facilities, BART could help a medical institution to serve more people as well as to minimize attendant traffic problems.

When development of the medical center at a given site preceded the location of BART stations and lines, we sought to investigate whether the institution had taken steps to connect itself to BART by local or private feeder carriers. Where institutional site selection followed the location of BART lines and stations, we looked to learn whether the selection of new development sites was influenced by proximity to BART. In either case, did the institution undertake public information programs or other procedures to encourage clients and others to travel by BART? Finally, was there evidence that the availability of BART had influenced policy implementations which served to resolve any of the conflicts between institutional and neighborhood goals? Data on institutional responses to BART would derive primarily from key informant interviews with administrative decision-makers.

III. RESEARCH APPROACH

The research approach adopted for the investigation of BART impacts on health care institutions combines a brief, self-administered survey of clientele groups with key informant interviews among administrative staff at selected health care institutions. Criteria for selection of case study facilities are presented below, followed by descriptions of the clientele groups targeted for survey, and the survey methods used.

A. Criteria for Selection of Case Study Health Care Institutions

Case study selection criteria were predicated on the research issues discussed in the previous section. Cases were selected to provide variety in the following characteristics:

1. BART access, with varying proximity to BART stations or feeder systems;
2. Geographic location and service outreach within the Bay Area;
3. Characteristics of clientele groups;
4. Specialized services and facilities;
5. Local factors, such as conflicts over neighborhood congestion and parking, or share in a community-based transportation system; and
6. Institutional policy or orientation toward the presence of BART.

One element was essential to the success of the survey approach at any of the facilities considered: the cooperation of institutional administration and staff. Assurances that we could expect full cooperation with the survey effort constituted the final prerequisite for case study selection.

B. Selected Case Study Institutions

Each of the five institutions selected for survey and key informant interviews provides for variety in the criteria specified above. They are described briefly below in terms of their reasons for selection as case studies.

1. Kaiser-Permanente Medical Center, Walnut Creek

Kaiser-Permanente Medical Center Walnut Creek offered an example of a relatively high-income clientele with proximity to BART

and other public transit. The medical center is located about fifteen minutes from the Walnut Creek BART station by locally-based feeder buses with ten-minute headways; the bus stop is across the street from the medical center. Kaiser presently contributes to the financial support of the feeder buses, along with local merchants and businesses. Located in the suburban East Bay, the facility has a relatively large service outreach, as determined by the survey, extending north to Rodeo and south to Pleasanton, with many patients travelling from communities served by BART. Figure 1 displays this service area by respondent origins. Kaiser Walnut Creek is a private membership facility; its clientele is predominantly middle-and upper-middle-income, and the percentage of ethnic minorities is low. The medical center offers an advanced level and variety of professional services and well-attended clinics. Of particular interest to our study was the automated multi-phasic laboratory, since its clientele would be predominantly well, with no physical disfunctions to limit their use of any transportation options.

2. Herrick Memorial Hospital, Berkeley

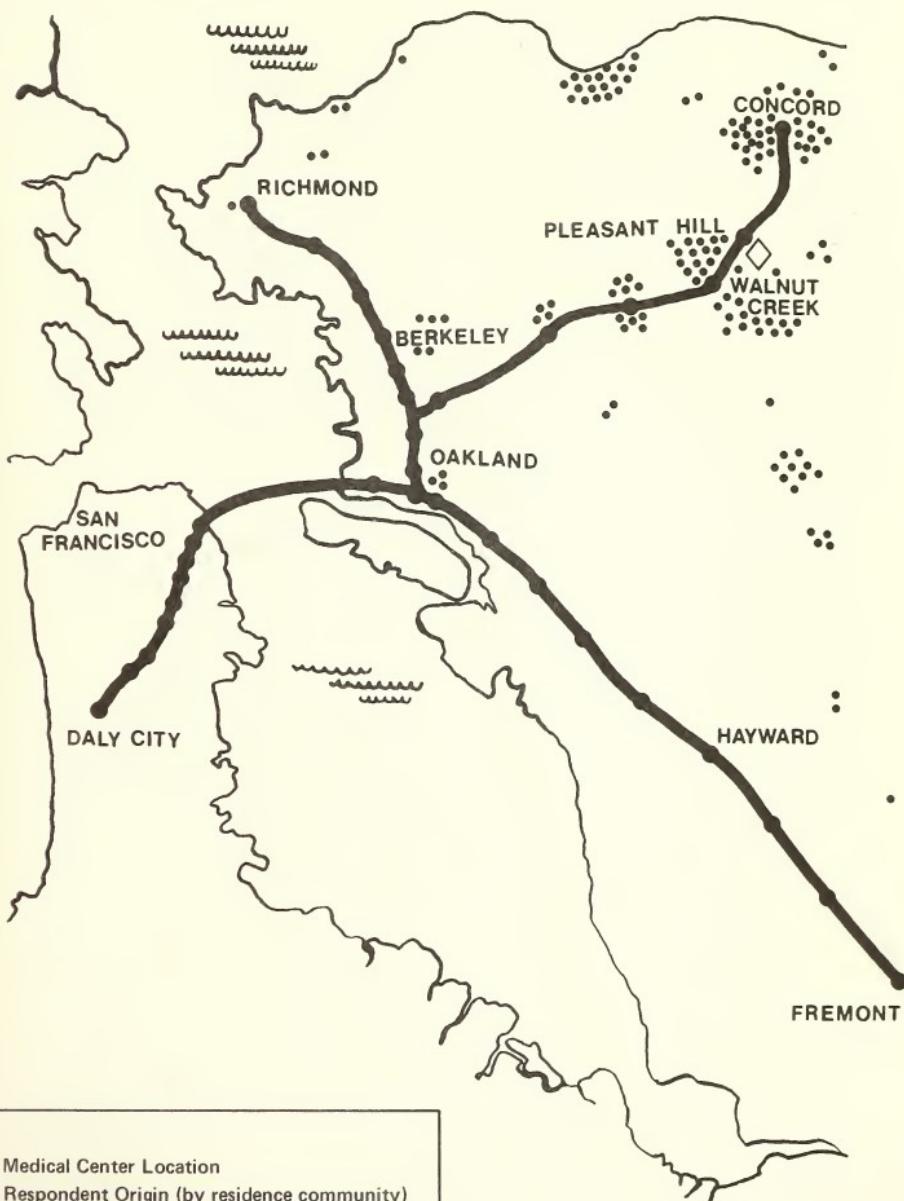
Herrick Memorial Hospital has good BART and public transit access and a predominately low-income, ethnically-mixed clientele. The hospital is located seven and one-half blocks from the downtown Berkeley BART station, and is conveniently served by A.C. Transit buses, which also connect with BART, from a bus stop less than a block away. Herrick is a publicly-funded hospital with a relatively limited service area, focusing mainly upon areas around Berkeley and Oakland, although several of those surveyed (including visitors) had travelled from San Francisco, Hayward and Concord, which are places served by BART. The Herrick Hospital service area as determined by the survey is depicted in Figure 2. Herrick's clientele includes a majority of low-income persons: administrators estimated some 50% of patients are unemployed, while only a slightly smaller number are enrolled in medical assistance programs. A very substantial proportion are black or young. Moreover, Herrick specializes in outpatient psychiatric services, a potentially good source for a highly mobile (i.e., not physically dysfunctional) clientele. A recent transportation self-study accompanied Herrick's plans for expanding its present facilities, and offered an opportunity to compare levels of use of different transportation modes to the hospital over time. Neighborhood assistance was elicited in hospital expansion planning and the design of new parking facilities.

3. University of California, San Francisco Medical Center

The University of California, San Francisco, Medical Center offered an example of a facility with only indirect BART access and a very broad range of clientele. Connected as it is with a prestigious university and offering a very advanced level and variety of services, the Medical Center demonstrated the widest service outreach of any of the institutions considered for study (see Figure 3). Patients travelled

Figure 1

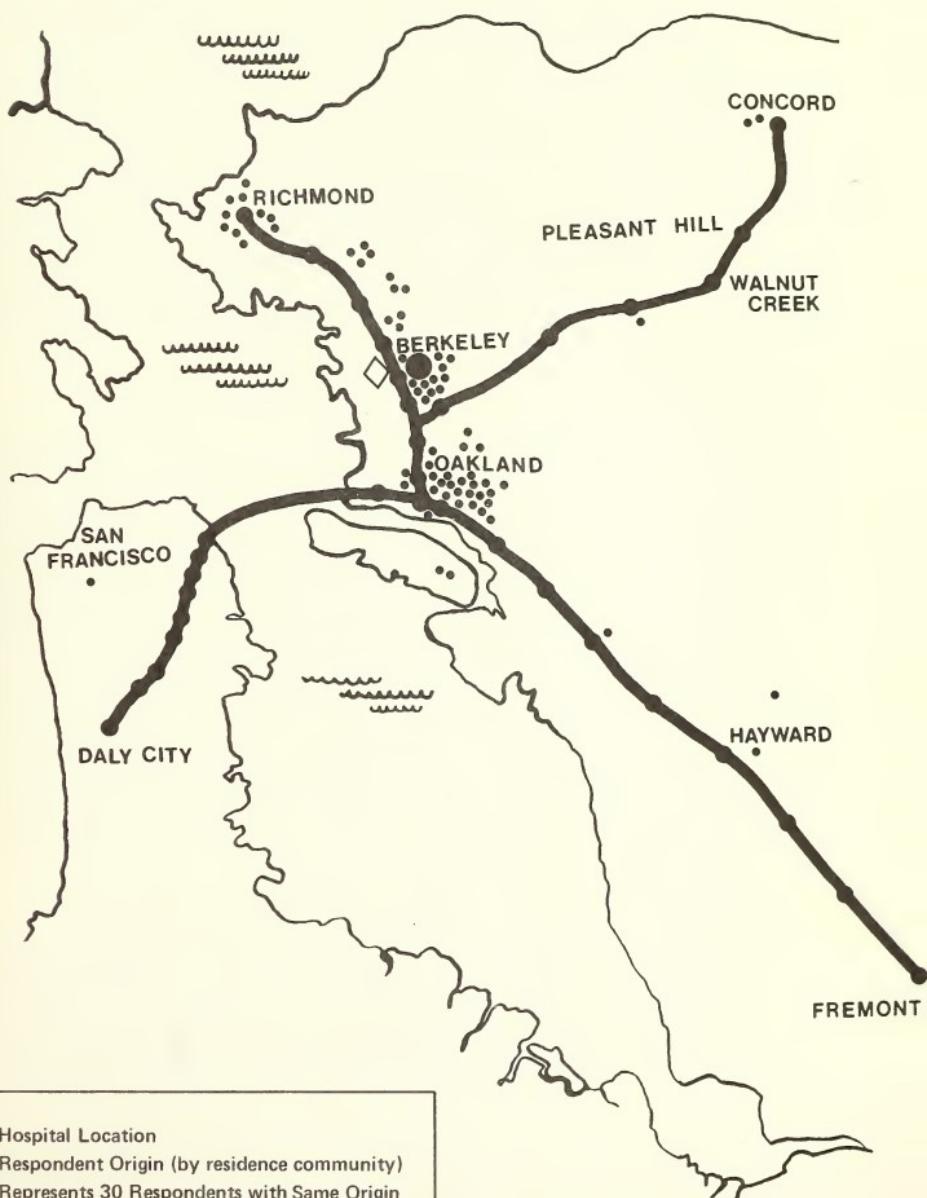
KAIser - PERMANente MEDICAL CENTER, WALNUT CREEK
SERVICE AREA AS DETERMINED BY SURVEY



- ◆ Medical Center Location
- Respondent Origin (by residence community)

Figure 2

HERRICK MEMORIAL HOSPITAL, BERKELEY
SERVICE AREA AS DETERMINED BY SURVEY



from as far away as Benicia, the southern peninsula and San Jose, with a substantial percentage from East Bay points served by BART. The Medical Center is located on Mt. Sutro, nearly three miles from the Civic Center BART station, although it is connected to BART and downtown San Francisco by Municipal Railway buses with ten-minute headways; the ride takes twenty-five minutes from Market Street. The clientele is very diverse, including all socio-economic segments of the Bay Area population. A battery of previous surveys conducted by the Medical Center revealed a large percentage (some 30%) of patients used public transportation to UCSF. Although these surveys did not specify BART as a response option they offered the potential for some comparative findings over time. These former surveys also queried the major factors influencing patients' choice of a medical facility. Local controversy between the neighborhood and the medical center focuses on the extreme scarcity of available parking and the competition for places among residents and hospital staff and patients.

4. Alta Bates Hospital, Berkeley

Alta Bates is a private hospital with an upper-middle- and middle-income clientele, fair proximity to BART and good connections with A.C. Transit. Alta Bates is located eight long blocks from the Ashby BART station, with connecting number 65 A.C. Transit buses along Ashby at 15-minute headways. Alternate BART routes incorporate connections via the number 41 bus (ten-minute headways) from the MacArthur Street Station to Telegraph and Ashby (two blocks away) or the numbers 51/58 (ten-minute headways) from the Rockridge Station to College and Webster (four blocks away). The hospital's service area as determined by survey is somewhat limited, extending east to Walnut Creek and north to Richmond--points served by BART--but centered in the Berkeley-Oakland area (see Figure 4). Alta Bates' clientele includes members of university-oriented youth, and a small proportion of lower-income elderly patients on Medi-care. The local situation is one of controversy over increased traffic and noise induced by the recent hospital expansion. Administrators expressed the hospital's desire to encourage its employees to use BART to get to work, and reported that the hospital is considering the question of providing its own feeder service from the Ashby station.

5. Kaiser-Permanente Hospital, Oakland

Kaiser-Permanente Hospital, Oakland is an example of a private hospital with middle and lower-income clientele, fair proximity to BART and good A.C. Transit connections. The hospital is about seven blocks east of the MacArthur Street BART station, to which it is connected by A.C. Transit bus via a five-minute ride with fifteen-minute headways to a stop in front of the hospital; however, administrators reported staff complaints about the bus service from BART. A private

Figure 3

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO, MEDICAL CENTER
SERVICE AREA AS DETERMINED BY SURVEY

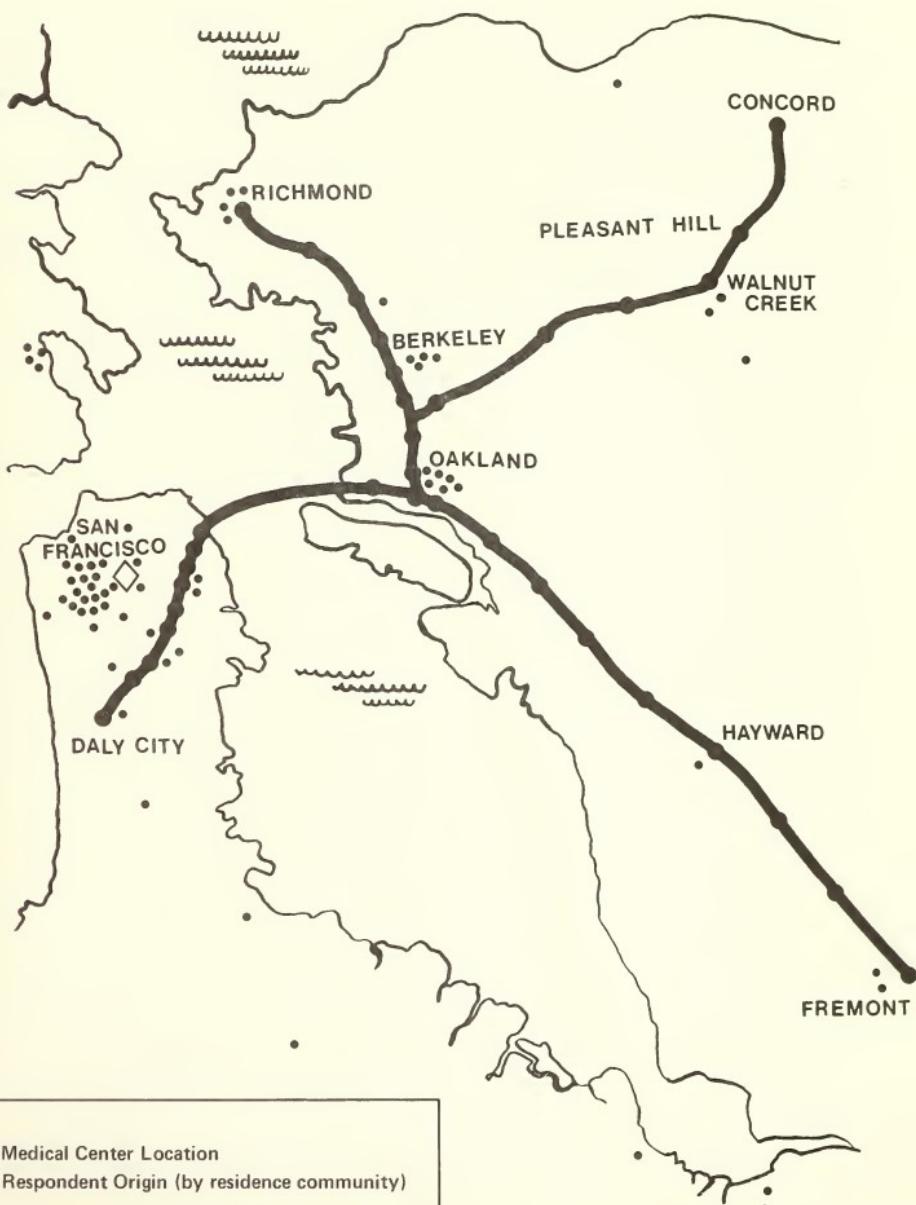
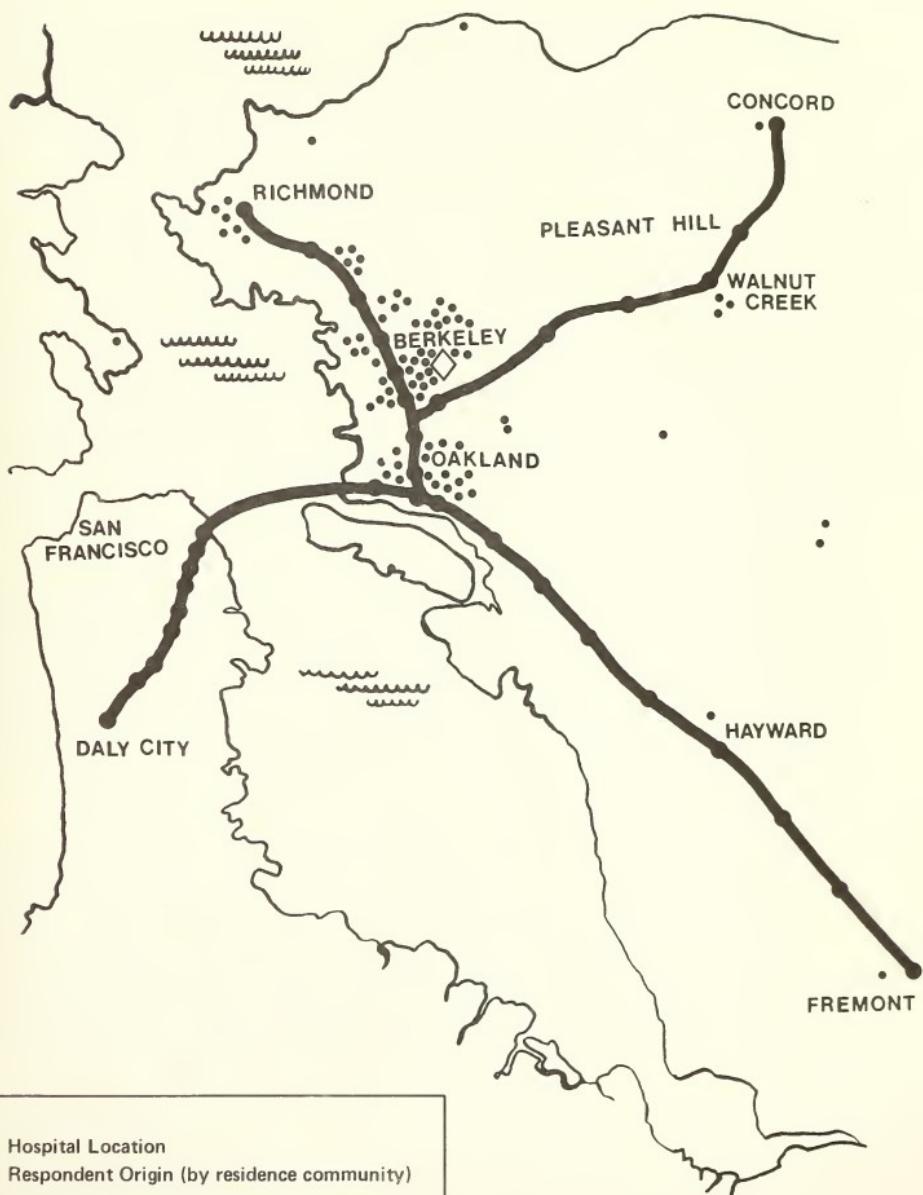


Figure 4
ALTA BATES HOSPITAL, BERKELEY
SERVICE AREA AS DETERMINED BY SURVEY



membership facility, the hospital's service area as determined by survey is relatively limited, extending from Richmond to Fremont, communities served by BART; four respondents had travelled from San Francisco, the peninsula, and San Jose (see Figure 5). The Oakland clientele includes a larger percentage of poor or working-class people than at Walnut Creek, including ethnic minorities and youth. Oakland Kaiser also offered a multi-phasic screening.

C. Survey Methods

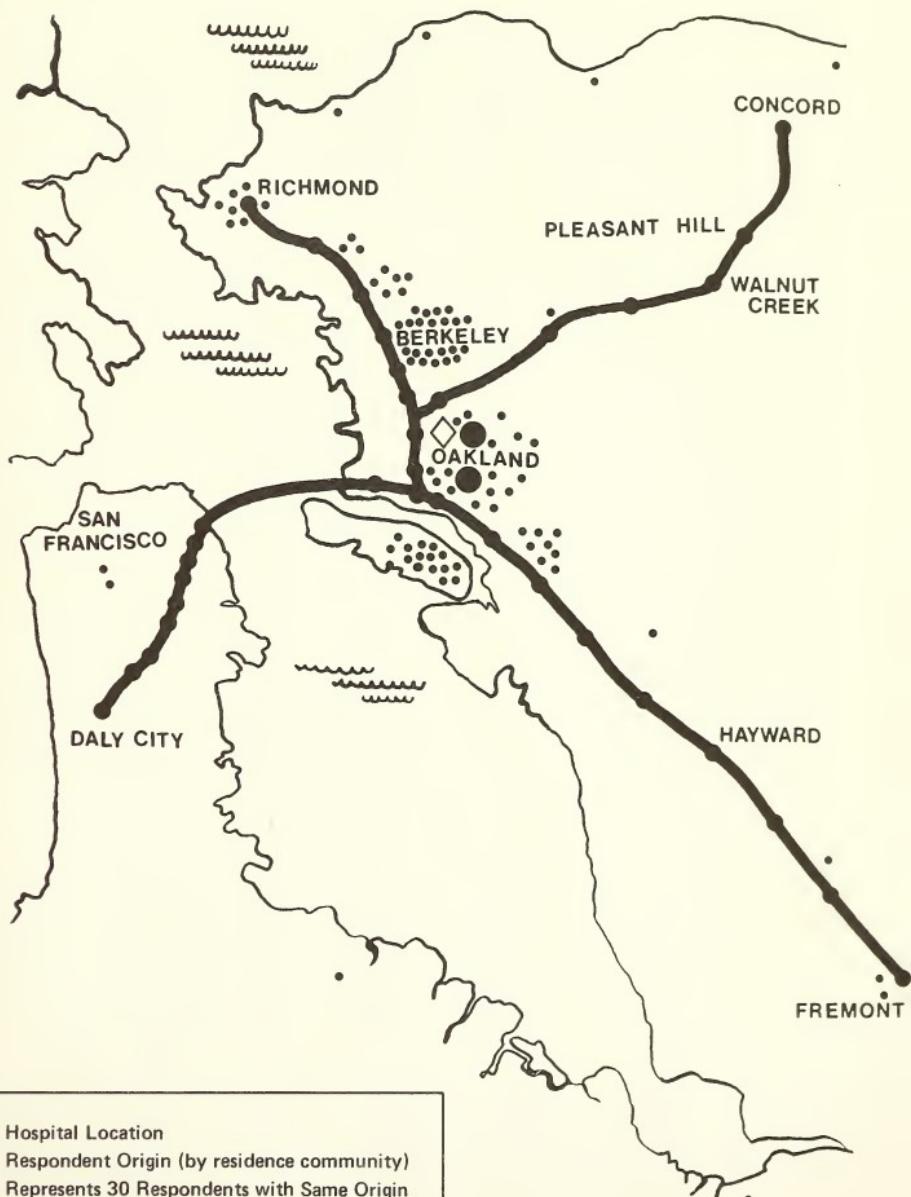
1. The Survey Population

The survey approach aimed at an outpatient population which could take advantage of a full range of transportation options. Thus we sought respondents who were relatively mobile (i.e., not severely disabled, aged, or handicapped), and if possible, who were keeping previously scheduled appointments, as that population which shared the greatest potential for incorporating use of BART or other public transportation into their health care routines. We therefore sought to exclude emergency patients from the survey sample, since this group had the least opportunity to plan their health care trip, while they might also be severely injured or otherwise prevented from using public transit.

Preliminary research and conversation with health care administrators focused on identifying which medical departments served our target clientele groups, and then determining which of those included the broadest spectrum of the residents served by the facility as a whole. Since we hoped to achieve comparability of findings between cases, it was also important to choose similar departments in each institution. However, it was not always possible to achieve this objective. Final selection of departments for survey depended upon administrative sanction or hospital outpatient registration procedures and routes, and these factors varied from institution to institution.

Sample sizes were determined by institution according to its total daily outpatient caseload, excepting emergency patients, as previously discussed. We aimed to achieve a ten per cent sample of each facility's total daily caseload by surveying at selected departments for one or two days, as necessary. Caseload and department attendance figures were provided by medical administrators, and since attendance recording procedures also varied among institutions, some of the caseload estimates are approximations based upon registration desk observations. We achieved our sampling objective in every case but one where staff cooperation was not forthcoming. Response rates in all but this instance were very high. Table I presents a complete summary of the survey work.

Figure 5
KAISER - PERMANENTE HOSPITAL, OAKLAND
SERVICE AREA AS DETERMINED BY SURVEY



- ◆ Hospital Location
- Respondent Origin (by residence community)
- Represents 30 Respondents with Same Origin

TABLE I

HEALTH CARE INSTITUTIONS SURVEY WORK

Medical Facility	Kind of Interview	Medical Departments	Sample Size	Outpatient Population	Date(s) of Survey	Clientele SES
Alta Bates Hospital	Short answer, self administered survey with informal interviewing.	Laboratory	88	450-600/day	Wednesday 6/30/76	Middle-income, and lower-income youths and elderly.
Herrick Memorial Hospital	Short answer, self-administered	All departments, volunteer desk.	58 out-patients, 30 visitors	300-500/day plus	Tuesday 6/29/76	Lower-income white and ethnic minority.
Kaiser-Permanente Hospital, Oakland	Short answer, self-administered	Multi-Phasic ENT	167	1500-2000 day	Wednesday and Thursday 5/19-20/76	Lower-and middle-income white and ethnic minority.
Kaiser-Permanente Medical Center, Walnut Creek	Short answer, self-administered	AML, ENT ²	159	1500/day	Wednesday and Thursday, 6/30 & 7/1, 1976	Middle-and upper-income, white.
University of California Medical Center, San Francisco	Short answer, self-administered	ENT, EYE, Registration	73	800-1000/day in clinics plus 200 private patients	Thursday, 7/13/76	Broad spectrum of Bay Area population groups.
Total						573 ³

¹ Outpatient caseloads and clientele SES based upon estimates of administrative staff; estimates exclude emergency cases.

² AML is Kaiser's abbreviation for their Automated Multi-phasic Laboratory; ENT is the usual hospital abbreviation for Ear, Nose & Throat departments.

³Total figures exclude 21 "other" respondents in Herrick survey, and 3 employees each at Oakland and Walnut Creek Kaiser and University of California Medical Center.

2. The Survey Approach

The survey was conducted by Jefferson Associates' personnel in cooperation with hospital staff. Our goal was to have the survey forms distributed among ordinary patient registration materials, as experience with this approach demonstrates that official sponsorship helps to achieve high response rates. Forms were distributed and collected by regular staff at Herrick, Kaiser Walnut Creek and Kaiser Oakland, and by Jefferson Associates personnel at Alta Bates Hospital and University of California Medical Center. Every person attending selected departments on the day of survey received a form and was requested to return it to the same individual or desk before leaving the hospital. In most cases, respondents completed the form while waiting to be called for their appointment. At Alta Bates and University of California Medical Center Jefferson Associates personnel also conducted informal interviews with a small sample of respondents to pursue the open-ended queries concerning respondents' transportation difficulties and dependencies, and the factors involved in their choice of the medical facility.

At Herrick Hospital Jefferson Associates personnel supported regular staff and volunteers to provide for interviewing visitors as well as patients. Surveying hospital visitors permitted us to investigate potential differences between visitor and patient travel patterns, and provided for comparisons with previous Herrick visitor travel surveys.

Jefferson Associates' personnel were also in attendance to ensure the uniformity of survey procedures and return of forms, to answer questions and assist disabled respondents and others, as necessary, to complete the questionnaire.

There were generally less than 15% outpatient refusals throughout the surveys. Visitors proved to be more reluctant to cooperate, and about 30% refused to participate.

3. The Survey Instrument

The survey instrument was designed to collect the necessary data with the briefest possible instrument, a prerequisite for success where respondents might object to unnecessary delay. A preliminary instrument was designed and pretested which took approximately three minutes to complete. The majority of questions were of a closed-ended, multiple-choice type, although several open-ended questions were included to probe into the areas of transportation needs and difficulties. The survey was self-administered. The preliminary instrument was presented to hospital administrators in conjunction with our request for and discussion of the survey at their institution. Several administrators requested specific changes in the format, wording or inclusion of questions, and these requests were accommodated in every case. Thus the survey form differs somewhat from institution to institution, although only a few questions are involved.

Particularly problematical was the question which probed the factors involved in the respondents' choice of a medical facility. This question was objectionable to some institutions; its inclusion was finally only permitted at two facilities. There were also several requests for changes in the wording of individual questions as well as of the survey greeting and explanation. Some institutional preferences for survey content probably grew out of concerns over traffic problems in the local setting, while others addressed the desire to protect the privacy of their clienteles. However the general uniformity of responses across all cases seems to indicate that these minor differences in the survey instrument did not significantly affect the results.

Exhibit I, presented at the end of this section, shows the format of the survey instrument and the wording of all questions, and notes the major differences in the content of the form among institutions.

C. Key Informant Interviews

In addition to the brief survey of patient (and visitor) travel patterns, we also conducted interviews with knowledgeable key informants among the administrative staff. The interviews addressed the potential and felt impact of BART upon patient travel needs and mobility, upon institutional policies and goals, and in resolving local conflicts centering on traffic or parking problems. Interviewers were principal researchers of the Jefferson Associates staff. The interview format was wholly informal, although the content of questions was fairly consistent, with minor variations based upon background information regarding the local situation. Administrators were generally willing to cooperate in key informant interviews; there were no refusals to participate, and a total of eight interviews were conducted.

EXHIBIT I

FORMAT AND WORDING OF ALL TRAVEL SURVEY QUESTIONS

Greetings:

(Name of health care institution) is cooperating with the Metropolitan Transportation Commission in conducting this survey to learn how people get to the (hospital/medical center). This information will help them to plan for the future. Please answer the questions below and return this form to the registration desk before you leave. Thank you.

Questions:

1. What community do you live in?

2. Why did you come to the medical center today?

- () I am coming for medical services
() I am an employee of the medical center
() I am visiting a relative or friend here
() Other: _____

3. How did you get to the medical center today?

- | | |
|--------------------------------|---------------------------|
| () car--I drove myself | () car + BART |
| () car--someone else drove me | () walk |
| () BART + bus | () taxi |
| () BART + walk | () bicycle or motorcycle |
| | () other: _____ |

4. How often do you come to the medical center?

- | | |
|---------------------------|----------------------------|
| () more than once a week | () about once a year |
| () about once a week | () less than once a year |
| () about once a month | () this is my first visit |

5. Did you have any difficulty in coming to the medical center? Please explain.

6. Do transportation problems in coming to the hospital affect your decision to seek medical care? Please explain.

7. Which of the following are your major concerns in seeking medical care? Please check all that apply.

- | | |
|--------------------------------------|-------------------------------------|
| () quality of care | () referral by another physician |
| () location of medical services | () referral by friends or family |
| () cost of care | () other: _____ |
| () availability of transportation | |

8. If you did not take BART (or other public transportation), would you have to arrange with a relative or friend to take you to the medical center?

- | | |
|-----------|----------|
| () yes | () no |
|-----------|----------|

9. Would any improvements in BART service encourage you to use BART to get to the medical center? Please describe. _____

10. Please check each of the transportation means which were available to you today for getting to and from the medical center.

- | | |
|--------------------------------------|-----------------------------|
| () car--I can drive myself | () car + BART |
| () car--someone else can drive me | () walk |
| () bus | () taxi |
| () BART + bus | () bicycle or motorcycle |
| () BART + walk | () other: _____ |

11. What means of transportation do you ordinarily use to get to and from places in the San Francisco Bay Area? Check below all travel methods which you use.

- | | |
|--------------------------------------|-----------------------------|
| () car--I can drive myself | () car + BART |
| () car--someone else can drive me | () walk |
| () bus | () taxi |
| () BART + bus | () bicycle or motorcycle |
| () BART + walk | () other: _____ |

12. The following is for statistical purposes only. Please check your age group.

- | |
|----------------|
| () under 21 |
| () 21 - 35 |
| () 36 - 50 |
| () 51 - 65 |
| () over 65 |

Note: Survey content was determined in consultation with administrative staff, and consequently varied somewhat between institutions. Question 7 was queried at University of California, San Francisco Medical Center and Kaiser-Permanente Hospital, Oakland. Respondent age group was not queried at Kaiser-Permanente Hospital in Oakland, and question 6, transportation problems in coming to the hospital, was not queried at University of California, San Francisco Medical Center.

III. FINDINGS

A. Overview of Survey Findings for All Cases

Aggregated responses for all facilities combined revealed extremely low levels of use of BART (an average 0.9%) or of other public transportation (7.7%). Modal choices on the day of survey are displayed by facility in Table 2. The general dependence upon the automobile (self-driven or driven by another) was overwhelming (86.7% of all respondents). However, as Table 2 demonstrates, the Herrick Hospital and University of California Medical Center clienteles showed over two and three times this average public transportation use, respectively. At Herrick, 17.2% (10 patients) used public transit including BART, while another nine used alternative non-auto modes. At University of California Medical Center 23.3% (17 patients) used BART or other public transportation.

On the other hand, Kaiser Walnut Creek and Alta Bates Hospital showed very high levels of private auto use (98.1% and 92.1%, respectively), very low levels of use of public transit (0.6% and 1.1%), and almost no BART use. The findings for Kaiser Oakland ranged somewhat between these two poles: 86.3% of respondents travelled by car and 9.6% used public transit (although none used BART).

Generalizing the findings across all cases tends to ignore the case site and clientele characteristics which might tend to explain these divergent findings. While it is true that even in the Herrick and UCSF cases, the levels of reported public transit and BART use are not very high on any absolute scale, they are remarkable within the case studies. Perhaps focusing on the factors coincident with these relatively high levels of public transportation use including BART would indicate the conditions under which public transit and BART could have the greatest impact.

Two sets of factors appeared to be the most important influences on public transit and BART use at the cases studied: the extent of respondents' transportation-dependence, that is, their dependence upon family, friends or public transit for transportation, and its effect on their decisions to seek care; and the particular site conditions which combined to render the automobile more or less convenient, such as congestion or scarce parking. Feeder systems from BART evidently played a role where they were not outweighed by other factors favoring the automobile.

Tables 3 and 4 report responses to queries relating to the issue of transportation-dependence. As Table 3 shows, a substantial minority of respondents (30.9% excluding non-respondents among all facilities combined) reported themselves to be dependent upon public transportation

TABLE 2

RESPONDENTS' TRANSPORTATION MODE TO MEDICAL FACILITY
ON DAY(S) OF SURVEY

Medical Facility

Transportation Mode		Kaiser Walnut Creek			Herrick Hospital*			Univ. of Calif. Med. Center			Alta Bates Hospital			Kaiser Oakland			TOTALS	
	No.	No.	%	Visitors	No.	%	Patients	No.	%	Med. Center	No.	%	Alta Bates Hospital	No.	%	Kaiser Oakland	No.	%
Car - self driven	130	81.7		19	63.3	20	34.5	30	41.0		65	73.9		114	68.3	378	65.7	
Car - driven by another	26	16.4		5	16.6	19	32.7	25	34.2		16	18.2		30	18.0	121	21.0	
Bus	1	0.6		1	3.3	9	15.5	16	21.9		1	1.1		16	9.6	44	7.7	
BART	1	0.6		2	6.6	1	1.7	1	1.4		0			0		5	0.9	
Walk	0			3	9.9	7	12.1	1	1.4		4	4.5		4	2.4	19	3.3	
Other Modes (taxi, bicycle, motorcycle etc.)	1	0.6		0		2	3.4	0			2	2.2		3	1.7	8	1.4	
TOTALS	159			30	58			73			88			167		575	100.%	

* Visitors as well as patients were surveyed at Herrick Hospital, and the two clientele groups are distinguished on this and the following tables; all others are patients only.

TABLE 3

WITHOUT PUBLIC TRANSPORTATION WOULD RESPONDENT BE DEPENDENT
UPON OTHERS FOR TRANSPORTATION TO MEDICAL CARE?

Medical Facility

Response	Kaiser Walnut Creek				Herrick Hospital				U.C. Med Center				Alta Bates				Kaiser Oakland				TOTALS			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Yes	26	16.3 (18.2)	10	33.3 (37.0)	27	40.6 (51.9)	35	47.9 (57.3)	26	29.5 (35.6)	35	21.0 (23.6)	159	27.7 (30.9)										
No	117	73.6 (81.8)	17	56.7 (63.0)	25	43.1 (48.1)	36	49.3 (42.7)	47	53.4 (64.4)	113	67.6 (76.4)	355	61.7 (69.1)										
No Response	16	10.1	3	10.0	6	10.3	2	2.7	15	17.0	19	11.4	61	10.6										
TOTALS			30	58		73			88		167		575	100.0%										

() Adjusted percentages, computed minus missing values.

TABLE 4

DO TRANSPORTATION PROBLEMS AFFECT RESPONDENTS' DECISION TO SEEK MEDICAL CARE?

Medical Facility

Response	Kaiser Walnut Creek			Herrick Hospital			Alta Bates			Kaiser Oakland			TOTALS		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Yes	16	10.1 (10.9)	2	6.7 (8.6)	8	13.8 (16.7)	3	3.4 (3.9)	21	12.6 (14.3)	50	9.9 (11.3)			
No	131	82.4 (89.1)	21	70.0 (91.3)	40	69.0 (83.3)	73	83.0 (96.1)	126	75.4 (85.7)	391	77.9 (88.7)			
No Response	12	7.5	7	2.3	10	17.2	12	13.6	20	12.0	61	12.2			
TOTALS	159		30		58		88		167		502		100		100.%

() Adjusted percentages, computed minus missing values.

family or friends if they needed to get to health services (question 8 of Exhibit 1). But the Herrick and UCSF findings include over twice as many expressed dependents as the other facilities. Similarly, although Table 4 demonstrates that transportation problems do not generally affect many respondents' decisions to seek care (question 6, Exhibit 1), Herrick Hospital's lead is consistent with its other findings indicating a transportation-dependent population. The question was excluded from the UCSF survey instrument at the request of the medical center administration.

The varying circumstances which apparently participated in different levels of BART and other public transportation impacts at each site, and the differing potential for increased BART and public transportation use among health care clientele groups leading to differing policy implications among cases, are important foci of the following discussion of individual case study findings.

B. Findings for Individual Cases

1. Kaiser-Permanente Medical Center, Walnut Creek

a. Survey Findings

Kaiser-Permanente Medical Center, Walnut Creek serves a very wide, predominantly suburban, East Bay area, as determined by the patient survey. Respondents resided as far north as Rodeo, as far south as Pleasanton and as far east as Pittsburg. The medical center is located close to the central Walnut Creek shopping area, and is served by local feeder buses with ten-minute headways from the Walnut Creek BART station. The ride from BART takes approximately fifteen minutes. Kaiser presently shares with local businesses in the financial support of the feeder system.

Survey forms were completed by 159 patients in the Ear, Nose and Throat Clinic and Automated Multi-Phasic Laboratory. This number represents ten per cent of the medical center's estimated 1,500 daily outpatients.

Use of BART and other public transportation as reported by respondents was extremely low. Only one respondent had used either mode, although as Figure 1 has shown, many had travelled from communities which are served by BART, including Oakland, Berkeley, Orinda, Lafayette, Pleasant Hill and Concord. Open-ended responses cited the difficulty of reaching BART from origin-end residential areas except by car, as the primary reason for respondents' non-use of rapid transit, and this analysis was also suggested by administrative staff in key informant interviews.

Transportation dependence as measured by the survey also was not high. As Table 3 shows, some 18.2% (excluding non-respondents) reported themselves as dependent upon family, friends, or public transportation to reach the medical center (question 8), while only

TABLE 5

TRANSPORTATION MODES AVAILABLE FOR USE TO MEDICAL FACILITY
ON DAY(S) OF SURVEY

Transportation Mode	Kaiser Walnut Creek	Medical Facility						TOTALS
		Herrick Hospital	Visitors	Patients	University of California	Alta Bates Hospital	Kaiser Oakland	
Car-self driven	153 40.1	21 31.3	24 17.5	40 23.4	66 31.3	117 50.9	421 35.1	
Car-driven by another	84 22.0	10 14.9	31 22.6	36 21.1	41 19.4	31 13.5	233 19.5	
Bus	26 6.8	13 19.4	27 19.7	42 24.6	38 18.0	43 18.7	189 15.8	
BART	56 14.6	6 9.0	24 17.5	17 9.9	26 12.3	18 7.8	147 12.3	
Walk	10 2.6	5 7.5	14 10.2	16 9.3	10 4.7	10 4.3	65 5.4	
Other Modes (taxi, bicycle, motorcycle etc.)	53 13.9	12 17.9	17 12.4	20 11.7	30 14.2	11 4.8	143 11.9	
TOTALS	382 100% ^a	67 100% ^b	137 100% ^c	171 100% ^d	211 100% ^e	230 100% ^f	1,198 100% ^g	

^a Percentages are calculated on the basis of total responses rather than on the basis of total respondents. Respondents could check as many as 6 available mode options; there were an average of 2 responses per respondent.

TABLE 6
TRANSPORTATION MODES ORDINARILY USED FOR NON-MEDICAL TRIPS

Transportation Mode	Kaiser Walnut Creek	Visitors	Herrick Hospital	Medical Facility	University of Calif.	Alta Bates Hospital	TOTALS	
	No.	%	No.	%	No.	%	No.	%
Car-self driven	145	42.6	22	37.3	22	21.0	44	28.8
Car-driven by another	78	22.9	7	11.9	23	22.0	29	18.9
Bus	13	3.8	9	15.2	22	21.0	36	23.5
BART	74	21.8	10	16.9	27	25.7	18	11.8
Walk	13	3.8	5	8.5	6	5.6	17	11.1
Other modes (taxi, bicycle, motorcycle, etc.)	17	5.0	6	10.2	5	4.7	9	5.9
							7	4.4
							44	5.3
TOTALS	340	100% ¹	59	100% ¹	105	100% ¹	153	100% ¹
							159	100% ¹
							816	100%

1. As in Table 5, percentages are calculated on the basis of total responses; respondents could check up to 6 options. There were an average of 1.4 responses per respondent.

2. Question 11 was not included on the Kaiser Oakland survey form.

10.9% stated that transportation problems influenced their decision to seek care (question 6). Indeed, of the 98.1% of respondents who travelled by car, 16.6% were driven by someone else while 1.2% used public transit. Thus, although transportation problems apparently complicate the health care trip for a minority of Walnut Creek Kaiser outpatients, the majority of these evidently have sufficient access to a car and driver to obviate their resorting to public transit to any appreciable extent.

It is noteworthy that respondents did include BART as the third most frequently mentioned mode among their available transportation options to the medical center (question 10; see Table 5). With 14.6% of responses, BART was preceded by the automobile with respondent as driver (40%) or passenger (22%), and followed by the bus (6.8%). Although BART and feeder buses serve the hospital, and whether or not the nature of the survey inflated the frequency of BART mentions -- they certainly exceed its actual use -- it is fairly clear that respondents do not perceive BART as offering a real alternative to the automobile. This same order held for modes mentioned as ordinarily used to other Bay Area destinations (question 11): 42.6% for auto with respondent as driver, 22.9% with respondent as passenger. Reported BART use was significantly greater, 21.8%, while bus use dwindled. This latter finding confirms the conclusion drawn from the former one: the respondents are aware of BART's availability, but are not incorporating BART use into their health care routines.

In sum, the findings suggest that BART has had almost no impact on Walnut Creek Kaiser's patients' mobility to health care. Although BART potentially offers an alternative transportation option to the medical center as witnessed by the availability of feeder services and the locus of patient origins within the facility's determined service area, it does not appear to enhance transportation-dependent respondents' accessibility to the facility.

b. Key Informant Interviews

Officers at Walnut Creek Kaiser expressed concern that current levels of client and employee usership of BART and the feeder buses if determined, would not justify Kaiser's share of the local system's support. Key Informants anticipated that our survey would find that most members drove; staff reportedly also relied primarily on their automobiles to get to work. The medical center had reported on the availability and routes of the feeder service in its periodic publications to members and staff, but although administrators felt that BART use was probably increasing, they couldn't say by how much, although they thought use levels were running below their original expectations. Policy-makers looked forward to a comprehensive travel survey which would serve to verify the equity of their current share of feeder support, or suggest re-apportionment of area business shares in the local service.

2. Herrick Memorial Hospital, Berkeley

a. Survey Findings

As Figure 2 shows, Herrick Hospital's clientele emanates predominantly from within the area from Richmond to Oakland, while a few patients and visitors reside as far away as San Francisco, Hayward, and Concord. As previously described, the hospital is situated seven and one-half blocks from Berkeley's downtown BART station, and is conveniently served by several A.C. Transit buses with ten-and fifteen-minute headways connecting it with either the downtown Berkeley or Ashby BART stations. Neither ride takes more than five minutes; the bus stops half a block from the hospital.

Herrick Hospital records laboratory rather than clinic attendance, and this figure not only includes emergency patients, but may also doublecount individuals needing more than one lab test. Therefore, staff estimated the daily caseload excluding emergencies at between 300 and 500 outpatients. The respondent sample of 58 outpatients adequately meets the ten per cent objective. Administrators estimated that half of the racially-mixed Herrick clientele used some form of public assistance. A large proportion were estimated to be young, and this characteristic is discussed again later.

As Table 2 reports, the Herrick survey showed one of the larger percentages of public transportation use (14.8% among visitors and patients, combining BART and bus riders), as well as of walkers (11.4%), of the facilities studied. This finding is consistent with the relatively younger age and lower income of the Herrick clientele, as well as the relatively limited service area of the hospital and the comparative convenience of public transportation to it.

Responses also reflected a greater transportation dependence as measured by the survey among the Herrick clientele than at any of the other cases except UCSF. A majority of Herrick patients (51.9%, adjusted for non-responses) stated that they were dependent upon family, friends or public transit to get to the hospital, and a large proportion (37%) of visitors responded similarly. Indeed, of the 68.2% of Herrick patients who travelled by car, nearly half (48.7%) were driven by someone else. A smaller percentage of visitors (20.8%) were passengers only. And 16.7% of patients reported that transportation problems influenced their decisions to seek care when they needed it.

A comparison of the present survey results with those of a previous Herrick Hospital survey conducted in 1974 is presented in Table 7. Both surveys included patients and visitors and queried identical transportation modes, although the Herrick survey used the somewhat inappropriate term "car pool", which may account for the correspondingly smaller frequencies of response for this option (the "other" category, perhaps a catch-all for uncertain replies, is larger in the early survey).

TABLE 7

TRANSPORTATION MODE DAY OF SURVEY: HERRICK HOSPITAL
1974 & 1976 COMPARED

SurveyTransportation

Mode (* Adjusted Column per- centage)	1974 (Herrick Hospital Survey)				1976 (Jefferson Associates Survey)			
	VISITORS	PATIENTS	TOTALS	%	VISITORS	PATIENTS	TOTALS	%
Drive Alone	100 (69.9)	28 (57.1)	128	64.0 (66.7)	19 (63.3)	20 (34.5)	39	44.3
Car Pool ("Car-driven by another")	13 (9.1)	10 (20.4)	23	11.5 (11.9)	5 (16.7)	19 (32.8)	24	27.4
Bus	8 (5.6)	6 (12.2)	14	7.0 (7.3)	1 (3.3)	9 (15.5)	10	11.3
BART	5 (3.5)	0	5	2.5 (2.6)	2 (6.7)	1 (1.7)	3	3.40
Walk	9 (6.3)	3 (6.1)	12	6.0 (6.3)	3 (10.0)	7 (12.1)	10	11.3
Other	8 (5.6)	2 (4.1)	10	5.0 (5.2)	0	2 (3.4)	2	2.3
No Response	5	3	8	4.0				
TOTALS	148	52	200	100%	30	58	88	100%

() Adjusted percentages computed minus missing values.

Comparison reveals some small increases in walking and the use of public transportation by patients, along with a decrease in the proportion of those driving themselves to the hospital, over the two-year period. A slightly greater proportion of patients from the later survey were also driven to the hospital by someone else, as noted previously.

The Herrick clientele's responses indicating the modes available to them for travel to the hospital on the survey day are consistent with the transportation dependence levels reported by them. Auto driven by another was the most frequently mentioned choice (22.6% of responses), followed by bus (19.7%), and BART and self-driven auto in a tie (17.5%). Visitors ranked self-driven auto first (31.3%), bus second (19.4%) and auto driven by another third (14.9%). BART ranked fourth with 9.0% of responses. Ordinary practice to other destinations also showed an emphasis on public transportation. Among patients, BART was ranked first in its frequency of mentions (25.7%), followed by auto driven by another (21.9%) and bus and self-driven auto (each with 21%). Visitors ranked self-driven auto first (37.3%), BART second (16.9%) and bus third (15.3%).

Several factors apparently contribute to clients' greater levels of use of public transit and BART to Herrick Hospital, in addition to their ethnic mix, low income (and presumably lower auto access), and greater expressed transportation dependency. Not only is public transportation readily available and convenient, but local conditions exert some pressure against automobile use. Herrick's expansion efforts have highlighted problems of local traffic congestion and limited parking. And the Berkeley population has witnessed continuing attempts to de-emphasize the automobile. However, the surveys took place prior to the opening of Herrick's new parking facilities; it remains to be seen how the expanded parking will impact upon client travel behavior.

The survey findings show that of the roughly 50% of patients who report themselves as transportation dependent, about one-third (about the same percentage as reports that difficulties with transportation influence their decisions to seek care) resorts to public transit, including BART, while the other two-thirds finds a ride in someone else's car. Still, these findings are not inconsistent with a tentative conclusion that public transportation provides mobility and enhances access to medical care for a minority of transportation-dependent persons. However, BART has a very minor impact.

b. Key Informant Interview

Our Herrick Hospital Key Informant administrator reported the hospital's awareness of the low-income, low-auto-access status of its clientele. The hospital hoped that BART would enhance outpatient access to the hospital, but didn't have the resources to formulate or implement policy goals to induce clients or staff to

use BART beyond occasional informational references to BART service and connections in the hospital newsletter. Feeder systems from the downtown Berkeley BART station were considered unnecessary in addition to existing A.C. Transit service, although the hospital hoped someday to provide additional service for handicapped clients. Preferential parking fee schedules are used to encourage employees to car pool. Free storage is provided for bicycles.

3. University of California, San Francisco Medical Center

a. Survey Findings

A major university facility, the University of California, San Francisco Medical Center demonstrated the widest service outreach of any of the medical facilities proposed for study. As Figure 3 showed, the majority of respondents originated from within San Francisco, but a large number also came from as far away as Marin County, Port Costa, the East Bay, San Jose and the southern peninsula as well as points served by BART. The medical center is located on Mount Sutro in a predominantly residential area. The staff is large, and the hilltop location renders nearby parking extremely scarce, creating a center of controversy with local residents. UCSF is nearly three miles from the Civic Center BART station, and connecting Municipal Railway buses (numbers 6 and 66) make the twenty-five-minute trip with ten-minute headways. It should be noted in the context of comparatively inconvenient BART service, that there is little direct public transportation to UCSF. Travel from south city points generally requires at least one transfer. The University's public transit accessibility problems were discussed in some detail by Key Informants. However, despite the apparent shortcomings of public transit to UCSF, the Medical Center's own September, 1975, Patient Attitude and Knowledge Study reported a relatively large proportion of clientele (33%) using public transportation, although BART was not a response option.

The UCSF Medical Center serves the full population spectrum of Bay Area residents of all income and ethnic groups. The daily caseload was estimated to be between 800 and 1,000 outpatients; our respondent total of 73 therefore fell somewhat below the ten per cent sampling objective, for two major reasons. First, staff cooperation was not forthcoming in the clinics. Second, surveys were conducted at the general registration desk, the Ear, Nose and Throat clinic, and, in compliance with administrative request, the Eye clinic, even though patients in this last department frequently required extensive assistance to complete the survey form.

Our survey revealed the greatest proportion of clientele using public transportation among the case study institutions, although the 21.9% we documented (see Table 2) was much less than the 33% recorded by the medical center. Only one respondent had used BART, although several originated in areas which enjoy BART service, such as Walnut Creek, Richmond, Fremont and Daly City. Yet the UCSF clientele apparently

need public transportation. As Table 3 shows, the majority of respondents (57.3%) reported themselves dependent upon friends, family or public transportation to get them to the medical center, and indeed, the majority (57.5%) also were either driven to the medical center by someone else or had used public transit including BART to get there. Nearly half (45.5%) of those coming by car were passengers rather than drivers. Medical Center administrators requested exclusion of question 6, whether transportation problems influenced respondents' decisions to seek care.

Responses indicating modes perceived as available for the health care trip are consistent with these levels of transportation dependency. UCSF patients ranked bus first among available travel options (24.6% of responses), self-driven auto second (23.4%) and auto driven by another third (21.1%). BART ranked fourth (9.9%), but was actually used by only one respondent. Ordinary practice to other destinations ranked self-driven auto first (28.8%), bus second (23.5%), auto driven by another third (18.9%, and BART fourth (11.8%). Apparently this is a population that thinks of public transit as part of its travel routines, although BART plays a comparatively minor role.

These findings indicate that public transportation to medical services becomes a viable alternative when the automobile is rendered relatively less convenient, or where auto access is limited. Although the majority of respondents who reported themselves to be transportation dependent still sought access to a driver and car, the levels of transportation use reported to UCSF are remarkable. BART continues to play only a small part in these patients' travel to health care, however. The distance from UCSF to BART may be a factor here, although most public transit routes to the Medical Center from residential areas require some kind of transfer.

b. Key Informant Interviews

Key Informants revealed an overriding concern with patient and staff accessibility to the medical center. The University's own surveys demonstrate its desire to settle the local controversy over competition for neighborhood parking. The University is presently committed to hire a transportation consultant to help the medical center ameliorate these problems. Another effort has been to obtain Cal Trans demonstration grant monies for urban transit problems to provide an extension of muni service to collect passengers from the Glen Park Bart station and the Forest Hill Muni station to the campus. A University-sponsored shuttle bus from the Forest Hill station is an additional alternative still in the preliminary planning stage. A previous staff commuter club collecting A.C. Transit and Southern Pacific passengers in downtown San Francisco to UCSF prior to operation of the Embarcadero BART station eventually folded for lack of sufficient interest, and the University is therefore not contemplating a renewal of this service as a collector from downtown BART stations. The medical center supports

employee car pools by leasing vans to groups of ten or more and extending preferential parking to private carpools.

4. Alta Bates Hospital, Berkeley

a. Survey Findings

Alta Bates Hospital is located in south Berkeley, roughly between the Ashby and Rockridge BART stations. A.C. Transit buses connect with the hospital via the number 65 bus along Ashby with fifteen-minute headways (a five-minute journey from the Ashby BART station to the hospital) and the number 51/58 up College with ten-minute headways (a five-minute journey from the Rockridge BART station to the College and Webster stop four blocks away), as well as the number 41 up Telegraph Avenue from the MacArthur Street BART station to Telegraph and Ashby, two blocks from the hospital. The Alta Bates service area as determined by our survey was relatively limited, extending north to El Sobrante, east to Walnut Creek and Danville, and south to Fremont; however, as Figure 4 shows, most respondents resided in the North Berkeley-Berkeley area. The local setting is one of conflict and active protest by neighborhood groups over the traffic nuisance and congestion caused by the influx of automobiles to the hospital.

A majority of the Alta Bates clientele consists of White, upper-middle and middle-income persons, with some elderly patients receiving state benefits, and young patients emanating from the University of California, Berkeley campus. The average daily caseload was estimated at 450 to 600 outpatients, so the respondent sample of 88 amply meets the ten per cent objective. In accordance with administrative request, the survey was conducted at the laboratory rather than in clinics.

As Table 2 shows, there was very little use of public transportation to Alta Bates Hospital (1 bus rider within the sample, and no one using BART). The overwhelming majority of respondents (92.1%) had travelled by car. Generally, the survey findings on indicators of transportation dependence were consistent with the low levels of public transit use reported. However it should be noted that Alta Bates respondents reported themselves as being dependent upon others for transportation to a greater extent than is confirmed throughout the data. Open-ended responses shed no additional light on this apparent discrepancy. Thus, as Table 3 shows, 29.5% (raw percentages not adjusted for non-respondents) of respondents stated that they were dependent upon public transportation, family or friends when they needed to get to medical care. However, only 3.4% reported that transportation problems affected their decisions to seek care (see Table 4). Moreover, only 18.2% of respondents were driven to the hospital by someone else. Thus only about two-thirds of the self-declared dependents actually used public transit or relied on another for transportation on the survey day.

Responses for modes perceived as available for transportation to the hospital on the survey day or ordinarily used for other Bay Area destinations are consistent with survey day practice. Self-driven auto ranked first among available modes (31.3% of responses) with auto driven by another second (19.4%), bus third (18.0%) and BART fourth (12.3% of responses). Ordinary practice showed a shift in favor of BART, with self-driven auto first (39.6% of responses), BART second (19.5%), auto driven by another third (18.9%) and bus fourth (12.6%). But the nature of a travel survey with its emphasis on public transportation may have influenced the frequency of responses for BART. This possibility is somewhat enhanced by the complete lack of BART use among the sample.

In sum, these findings reveal that public transportation has only a minor impact on patients' mobility to Alta Bates. Indeed, even self-declared transportation dependents resort primarily to the automobile. Although respondents are apparently aware of BART, it has no impact on their mobility to health care, and despite its potential alternative access to Alta Bates Hospital and the local problems attendant to private auto use, BART appears to be no real alternative for the overwhelming majority of respondents.

b. Key Informant Interviews

Administrators emphasized the hospital's efforts to enlist neighborhood participation to mitigate its impact on the local community. Traffic problems have been a primary focus of periodic meetings with community advocates to address neighborhood concerns and discuss the hospital's planning and development objectives. Alta Bates has been considering a staff park- and- shuttle bus service to the hospital, with the Ashby BART station as a likely site. However, administrators expressed their concern over the expense of such a system in the face of uncertainty as to its use by staff as the primary obstacle to its implementation. No final decision has been reached.

5. Kaiser-Permanente Hospital, Oakland

a. Survey Findings

Oakland Kaiser is located some seven blocks from the MacArthur Street BART station, to which it is connected by A.C. Transit, via a five-minute journey with fifteen-minute headways to a stop in front of the hospital. The hospital demonstrated a rather large service outreach as depicted in Figure 5, which extended from Crockett and Pinole down to Fremont, and included several respondents who travelled from as far away as San Francisco, Redwood City and San Jose. Oakland Kaiser is a membership hospital serving predominantly middle-and lower-income working people, including whites, blacks and Latinos. The average daily caseload was estimated at 1,500 to 2,000 outpatients. We surveyed 167 patients in the Ear, Nose and Throat and Multi-Phasic departments.

The majority of survey respondents had travelled to the hospital by private automobile (68.3% alone, 18% as passengers, as reported in Table 2). None of the 167 respondents had used BART, but sixteen (9.5%) had travelled by other public transportation. Thus the Kaiser Oakland results fall between the extremes established by Walnut Creek Kaiser and Alta Bates on the one hand, and Herrick Hospital and UCSF Medical Center on the other.

In keeping with this middle-range and comparatively low socio-economic status of the Oakland Kaiser clientele, 23.6% (adjusted) declared themselves to be dependent upon family, friends or public transportation to get to health services as Table 3 shows, and a comparatively large 14.3% stated that transportation problems affected their decision to seek care (see Table 4). Indeed, a combined 27.6% either were driven to the hospital or had used public transportation, so that the Oakland Kaiser population actually appears to be a little more dependent than it declares itself to be.

Responses for modes available for respondents' transportation to the hospital on the day of survey maintain this minor but real emphasis on public transportation. Although self-driven auto led by a wide margin (50.9% of responses), bus was the second most frequently chosen option (18.7%), followed by auto driven by someone else (13.5%). BART was fourth with 7.8% of responses. Ordinary practice to other Bay Area destinations was not queried at Oakland Kaiser.

In sum, these findings suggest again that transportation dependency and public transit use are related, but that BART plays no significant part in this relationship. BART had no impact on the mobility of patients to Oakland Kaiser, and although feeder service is available from the MacArthur Street station, rendering BART a potential access mode, transportation-dependent respondents resorted to other public transportation or relied on finding a ride with someone else to get them to the hospital.

b. Key Informant Interviews

Key Informants reported that staff frequently complained that the bus connection from BART was too irregular for BART plus feeder to be used as a dependable commute mode. They applied this knowledge to speculate that the shortcomings of the feeder service contributed to patients' lack of BART use to the hospital. Parking is usually readily available at the hospital, and this factor also weighs in favor of the private automobile. The administration expressed Kaiser's basic policy orientation that members will travel to the most convenient facility; therefore the hospital had no plan to involve itself in patient accessibility to the hospital, or to provide its own feeder service from BART.

6. Other Findings

a. Survey Results

We attempted to survey the major priorities which participated in people's choice of a medical facility. The relative importance of concerns such as the costs, kind and quality of services, the location of facility and availability of transportation to it, as well as a number of other factors would help to indicate the overall significance of transportation in people's health care routines. These factors had been queried successfully in UCSF Medical Center's 1975 surveys, and thus there was also the possibility of comparable findings over time. However, this question was only permitted by two of the case study institutions. Results for these cases are displayed and compared with the earlier UCSF findings in Table 6. UCSF patients ranked the quality and cost of services and a physician's referral above the location of the facility or availability of transportation to it. Kaiser Oakland patients placed a majority emphasis on the facility location, perhaps confirming the basic Kaiser service policy addressed earlier. However, these findings are not conclusive or generalizable in themselves.

Respondents age groups were queried at four of the five case studies and these results are shown in Table 9. Responses show a population which is nearly half (49.7%) under 36 years of age and nearly half (50.3%) over 36 years of age. Once again it is noteworthy that Herrick Hospital and UCSF have the youngest respondent samples (51.1% and 64.4% under 36 years compared to 44.0% and 37.5% at Kaiser Walnut Creek and Alta Bates, respectively) as well as the highest levels of public transportation use. And indeed, 72.2% of those using public transportation to UCSF were under 36 years of age, while 66.7% of Herrick patients were in this age group. Both BART riders were young.

Finally, it is noteworthy in the context of minimal BART impacts over all cases that BART is consistently acknowledged by respondents to have been available to them for travel to the health care institution, or reported as ordinarily used by them to other Bay Area destinations to a much greater extent than it was actually used on the survey day. Figure 6 compares responses for perceived availability, actual survey day use and reported ordinary use of various modes. Respondents' lack of BART use thus does not apparently stem from ignorance of BART availability or routes. Question 9 (see Exhibit 1) attempted to probe reasons for respondents' lack of BART use, but perhaps the survey should have devoted additional focus to the time, cost and other factors respondents considered when planning their health care trip.

TABLE 8

RESPONDENTS' MAJOR CONCERN WHEN CHOOSING A MEDICAL FACILITY

University of California 1975, University of California, 1976 And
Kaiser Oakland 1976, Compared

	Univ. of Calif. Medical Center, 1975 ¹		Univ. of Calif. Medical Center, 1976 ²		Kaiser Oakland, 1976 ²	
<u>Major Concerns</u>	<u>Two surveys, Sept., 1975</u>		<u>July, 1976</u>		<u>May, 1976</u>	
	No.	%	No.	%	No.	%
Services Offered	53	26.1	41	23.8	N/A ³	
Quality of Care	65	32.0	53	30.8	45	32.8
Location of Clinic/ Location of Medi- cal Services	13	6.4	11	6.4	17	12.4
Prestige of Clinic	10	4.9	3	1.7	N/A	
Cost of Care	28	13.8	30	17.4	30	21.9
Availability of Transportation	N/A		N/A		11	8.0
Referral by Friends/Family	4	1.97	6	3.5	9	6.6
Referral by Physician	29	14.3	24	14.0	24	17.5
OTHER	1	0.5	4	2.3	1	0.7
TOTAL Respondents	106		92		73	
TOTAL Responses	203		172		137	
	1		122			

1. University Of California Patient Attitude & Knowledge Study, September, 1975.

2. Jefferson Associates survey for ILS Project, 1976.

3. N/A, "not applicable," is entered for data not queried in the given survey.

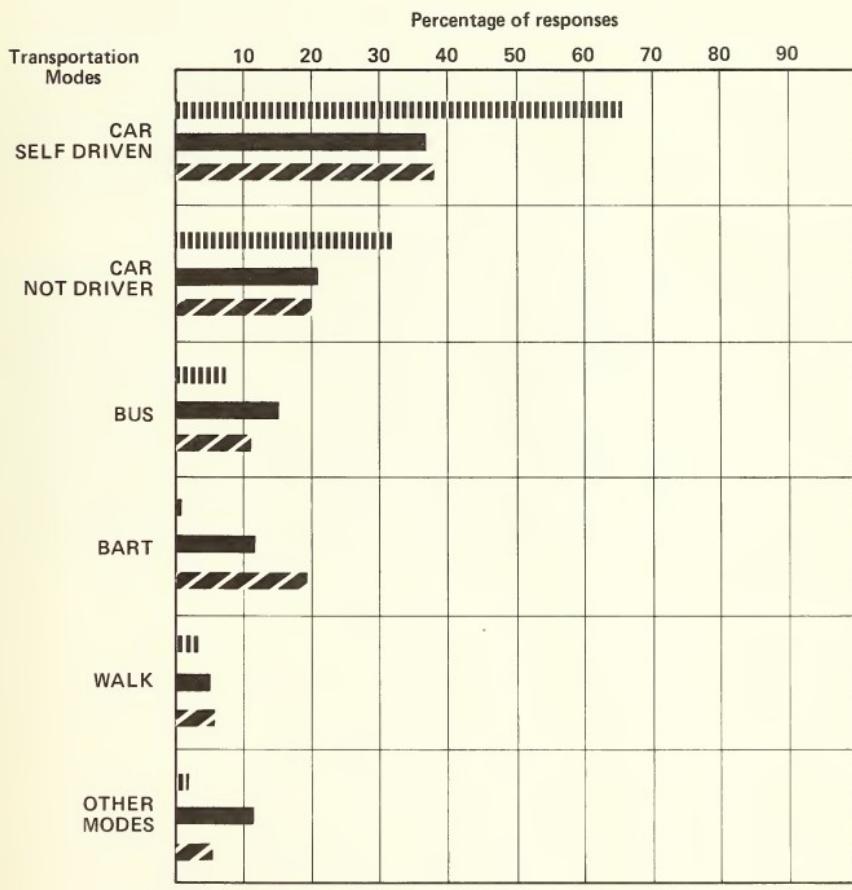
TABLE 9

RESPONDENT AGE GROUPS
Medical Facility

Age Group	Kaiser Walnut Creek			Herrick Hospital			University of California Medical Center			Alta Bates Hospital			TOTALS		
	No.	%	No.	Visitors	Patients	No.	%	No.	Visitors	Patients	No.	%	No.	%	No.
Under 21 yrs	14	8.8	0	-0-	1	1.1	6	8.2	.	4	4.5	25	6.3		
21 - 35 yrs	56	35.2	13	43.3	31	50.0	41	56.2		29	33.0	170	43.4		
36 - 50 yrs	49	30.8	3	10.0	9	13.6	12	16.4		19	21.6	92	23.5		
51 - 65 yrs	37	23.3	10	33.3	8	20.5	7	9.6		11	12.5	73	18.6		
Over 65 yrs	3	1.9	3	10.0	7	11.4	7	9.6		12	13.6	32	8.2		
No Response	0	-0-	1	3.3	2	3.4	0	-0-		13	14.8	16			
TOTALS	159		30	58			73			88		408			

Percentages are computed minus missing values.

Figure 6
PERCEIVED AVAILABILITY
AND ACTUAL USE OF VARIOUS MODES



||||| Transportation Mode Day of Survey

— Available Mode Day of Survey

/\ Ordinary Mode, Other Destinations

b. Key Informant Interview

In addition to key informant interviews among administrative staff at the case study institutions, we also spoke with a facility location decision-maker at Kaiser Hospitals, who reported that BART proximity had influenced selection of the location of Kaiser's new Richmond facility. Three sites were considered, a large site in the Hilltop area; one at 14th Street and Cutting Boulevard, where Kaiser already owned property and had considered acquiring more land for expanded facilities, but which was over half a mile from BART; and the small site near 14th and MacDonald, two and a half blocks from the Richmond BART station, which was the selection made. BART was reported to be a "predominant" factor in the selection process.

The Kaiser Vice President for Property felt that BART proximity could improve Kaiser's potential for recruiting employees from a wider area to the new Richmond facility. BART would presumably provide an alternative work trip mode for clinic staff as well as for administrative personnel travelling to the Richmond facility or between facilities and the Oakland headquarters. Moreover, BART access might facilitate members' reaching the facility, although BART access was not expected to recruit or increase Richmond membership since the location of new Kaiser facilities is predicated upon the determination of potential markets within a prescribed geographical area. Finally, proximity to BART allowed Kaiser's choice of the smaller site, because the new clinic would presumably require less parking space to the extent that members and employees availed themselves of BART. However, no conversion factors were applied to determine how much parking space could be eliminated because of closeness to BART.

IV. CONCLUSIONS AND POLICY IMPLICATIONS

A. Conclusions

In general, health care institutions with similar clienteles produced similar findings: Walnut Creek Kaiser and Alta Bates both serve predominantly white, upper-middle and middle-income clients, and these hospitals reported extremely low levels of public transit use, low indicators of transportation dependency, and high levels of private auto use. On the other hand, facilities like Herrick Hospital and UCSF served varied clienteles including ethnic minority and low-income persons (in the Herrick case, some 50% of clients were reported to be receiving some kind of public assistance), and these institutions showed higher levels of public transit use and transportation dependency, and lower levels of private automobile use. Within the sample of case studies, Kaiser Oakland, whose clientele ranged between these poles, also reported middle ranges of transit use and transportation dependency.

Local site factors also apparently participated in the levels of transit use reported. For example, at UCSF parking is extremely scarce, rendering the auto relatively less convenient. And public transportation was readily available and convenient to Herrick Hospital. However, socio-economic factors evidently override local conditions within the case studies, for nearby residents actively protest traffic nuisances and congestion around Alta Bates, but with little apparent effect on client travel behavior. In all cases, BART use was extremely low, and this finding generally cut across socio-economic and local site factors.

These divergent findings lead to differing conclusions according to the features of the individual cases. First, where local factors do not militate against automobile use and clientele socio-economic status (and presumably, auto access) are high, public transit and especially BART will have little or no impact on patient mobility or access to medical care. On the other hand, where local conditions reduce the relative convenience of the automobile and/or clientele incomes are middle to low or largely mixed and transportation dependency correspondingly greater, transit and BART may have some impact on clients' mobility and accessibility to health care. BART will have impact to the extent that it enhances access to the health care facility. If alternative transit exists to the facility, BART impacts will be minimized in proportion to the competitive trade-offs clients make between transit alternatives (this is the condition at the sites reporting significant levels of public transportation use). However, in either case, findings indicate that only a minority of clients (perhaps up to 30%) will use public transit to health care institutions.

B. Policy Implications

Our study did not focus upon the factors involved in travellers' choice of one or another transportation mode. However, it seems that data on health care patients' thresholds for the dollar and time costs of alternative modes might help to clarify the relationship of BART to transit use in people's health care routines. Income was apparently a factor in levels of transit use; presumably income would also be a consideration in modal choices.

The survey findings also indicated that on-site conditions influence clients' levels of use of transit. Thus, feeder services may be instrumental in encouraging clients and staff to use BART, but attention must be paid to the particular conditions at the case site. Alta Bates and UCSF are both considering feeders as a means to alleviate local traffic or parking problems. Yet the two populations reported such different modal splits as to caution against implementing a similar solution at both places. The availability of on-site parking (scarce at UCSF, plentiful at Alta Bates) is another factor that could be directed to influence staff and client travel behavior.

Finally, the surveys found that a small but significant minority of patients relies upon public transit to get to health care. Additional study of this group's health care travel requirements and trade-offs could serve to shape extremely responsive policies. If BART is intended to serve these market segments--or to attract transportation dependents currently relying on rides with others--then it needs to be rendered competitive for them in terms of cost and convenience with alternative transit modes.

